

PROCESSING NEGOTIABLE ECONOMIC CREDITS THROUGH  
ELECTRONIC HAND HELD DEVICES

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BACKGROUND OF THE INVENTION

1. Technical Field of the Invention

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The present invention is generally related to electronic hand held devices (hereinafter referred to as "hand held devices"), electronic commerce ("E-commerce"), negotiable economic credits, such as coupons and enterprise awards/credits. The present invention is also related to hand held devices, such as a Personal Digital Assistant (PDA), wireless telephone, pager, or other mobile computing and storage device adapted for use in E-commerce. The present invention is also related to wireless and wireline computer networks. The present invention is also related to the fields of electronic cash, credit, and product management for retail establishments, organizations, and customers. The present invention is also related generally to merchandising systems and systems for generating and redeeming product discount coupons and enterprise credits or awards.

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## 2. Description of the Related Art

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The recent shift in the consumer electronics industry from an emphasis on analog technology to a preference for digital technology is largely based on the fact that the former generally limits the user to a role of a passive recipient of information, while the latter is interactive and allows the user to control what, when, and how he or she receives and manipulates certain information.

This shift in focus has resulted in the development and increasingly widespread use of, for example, a hand held digital device generically referred to as a "personal digital assistant" (PDA). These hand held devices are becoming increasingly popular for storing and maintaining information. Hand held devices, such as PDAs, may be connected to a desktop personal computer, networks or other PDAs via infrared, direct wire, or wireless communication links.

Unlike personal computers, which are general-purpose devices geared toward refining and processing information, PDAs are designed to capture, store and display information originating from various sources.

Additionally, while a certain level of skill is required to use a personal computer effectively, hand held devices, such as PDAs, are designed with the novice and non-computer user in mind.

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A typical PDA includes a microprocessor, a memory unit, a display, associated encoder circuitry, and selector buttons. It may optionally contain a clock and infrared emitter and receiver. A graphical user interface permits a user to store, retrieve and manipulate data via an interactive display. A PDA also typically includes a calendar, datebook, and one or more directories. The calendar shows a month of dates organized as rows and columns in the usual form. The datebook shows one day at a time and contains alphanumeric text entered in free format (typically, with a time of day and an event and/or name). Each directory contains entries consisting of a name field and a free form alphanumeric text field that can contain company names, addresses, telephone and fax numbers, email addresses, etc.

Entries may be organized alphabetically according to the name field and can be scanned or searched for by specifying a specific sequence of characters in the name

field. A menu displayed via the graphical user interface permits a user to choose particular functions and directories. Most PDAs come equipped with a stylus, which is a plastic-tipped pen that a user utilizes to  
5 write in a "graffiti area" of the display and tap particular graphically displayed icons. Each icon is indicative of a particular activity or function.

PDAs are increasingly being utilized to access  
10 information from remote computer networks, such as the "World Wide Web" and the "Internet," both terms well known in the computer networking arts. PDA users can, for example, download e-mail from the Internet to the PDA. Web sites also exist that permit PDA users to  
15 access and download software that may be run on the PDA. For example, some web sites offer information to PDAs in the form of compressed news articles, stock quotes, and other data obtained from a wide variety of other electronic web-based sources.

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Based on the foregoing, it can be appreciated that a large number of users of hand held devices, such as PDAs, pagers and mobile telephony are increasingly relying on such devices to maintain and transmit a  
25 variety of personal and business information.

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Discount coupons have long been distributed by manufacturers to merchandise their products and by retail stores or establishments to attract consumers to their particular stores. Both coupon types are typically distributed to attract customers to engage in commercial transactions. Such coupons are effective if utilized by a sufficiently high percentage of customers. Utilizing this gauge, free-standing inserts are not very effective. Their redemption rate is presently approximately 2.8 percent and dropping.

Typically, coupons are physically collected at stores and credit is provided to the customer purchasing the corresponding product. The coupons are generally bundled and forwarded to a clearing house and then to a redemption center for sorting and counting. Reports are eventually forwarded to the manufacturers issuing the coupons in order to eventually generate a credit to the stores redeeming the coupons. It may unfortunately take several months before a store is reimbursed for coupons under present coupon redemption/processing methods.

Another problem associated with coupons is a significant misredemption rate of between 20 and 30

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percent as a result of misidentification and outright fraud. The misredemption problem is exacerbated by the enormous amount of time, usually a number of months, that it takes to reimburse the retail stores for the discount given the customer.

Attempts have been made to address such problems. Such attempts, however, have resulted in additional problems, while not fully addressing the problems described above. For example, some organizations have implemented a product specific micro-marketing system tied to a product point of selection and proprietary hardware in the form of an alerting platform attached to a grocery cart. A consumer within a retail establishment presses a button on the grocery cart alerting platform to select an electronic coupon when a coupon is graphically displayed at the exact product location within the retail establishment.

The customer and the cart must be located at the point of selection to access the coupon. Such a micro-marketing system is proprietary in nature and requires a customer to retrieve a coupon only from the point of product selection within the store. Thus, because of the proprietary nature of the system, the coupons, the

alerting platform and other proprietary hardware may not be utilized at other retail establishments. Furthermore, the enterprise associated with the retail establishment is burdened by the maintenance, replacement, and repair  
5 of the proprietary hardware attached to the retail establishment's shopping carts due to use, abuse, the weather and so forth. Other systems known in the art utilize smart cards and card readers/writers at the point of product selection for obtaining coupon data.

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Accordingly, alternatives are needed to traditional mass marketing and couponing techniques, and proprietary, point of selection type systems. A need exists for non-proprietary based systems that are  
15 flexible, efficient and consumer friendly. Further a need exists for couponing devices that are not owned by the enterprise or retail establishment, but owned by the customers themselves and which can be utilized at other retail establishments and enterprises. Such a device  
20 and associated systems and methods, should be ubiquitous in nature to avoid the problems inherently associated with prior proprietary-based systems.

It has become apparent to the present inventors  
25 that the ability to acquire and store electronic coupons

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and credits on hand held devices would free users of the time consuming tasks of clipping, organizing and redeeming traditional paper coupons, and the problems associated with proprietary marketing systems. It has  
5 also become apparent to the present inventors that for merchandisers and manufacturers such hand held devices could be utilized to effectively market, compile and negotiate coupon exchanges much more efficiently than the traditional paper coupon processing methods or  
10 proprietary-based micro-marketing systems and methods.

It is believed that aspects of the invention presently described herein solve the traditional problems associated with paper coupons and/or other  
15 negotiable economic credits (e.g., E-cash, frequent flier miles, or other enterprise awards or incentives), and the problems associated with proprietary-based micro-marketing systems thereof, while addressing an area of user control that has not yet been considered,  
20 anticipated, or utilized by coupon/credit merchandisers and manufacturers, namely, the increasing number of individuals who rely on hand held devices, such as PDAs, to maintain and store personal and business information.



# SUMMARY OF THE INVENTION

It is therefore an aspect of the present invention to provide improved methods and systems for conducting E-commerce utilizing hand held devices.

It is another aspect of the present invention to provide improved methods and systems for processing negotiable economic data (e.g., coupons, credits, or other financial incentives and awards) through hand held devices.

It is yet another aspect of the present invention to provide improved methods and systems, including program products related thereof, for generating, capturing, and redeeming product discount coupons and other negotiable economic credits or awards (e.g., frequent flyer miles).

The above and other aspects are achieved as are now described. Methods and systems are disclosed herein for processing negotiable economic credits, including electronic coupons and other electronic credits, incentives, cash or awards, through a hand held device.

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A hand held device, such as a PDA (Personal Digital Assistant), cellular telephone, paging device, or wireless PDA, or a combination thereof, may be  
5 synchronized with a point of sale. The hand held device has at least one negotiable economic credit, or associated data, stored as electronic data in a database therein. Such negotiable economic credits can be composed of coupon data representative of electronic  
10 coupons and/or other negotiable economic credits, such as credits/awards (e.g., frequent flyer miles, e-cash, etc.). The negotiable economic credit can be then transferred from, or at the request of, a hand held device to the point of sale in response to  
15 synchronization of the point of sale with the hand held device. The negotiable economic credit or credits can be then automatically redeemed at the point of sale in response to transferring the negotiable economic credit, or associated data, from the hand held device to the  
20 point of sale.

The hand held device may also be configured to acquire negotiable economic credits from a network resource, a static reference or other representation of  
25 a negotiable economic credit. For example, such static

references or representations may be paper-based or  
label-based having unique codes, such as bar codes or  
holograms associated therewith. Such a static reference  
or representation may be captured through optical  
5 scanning/capturing capabilities resident in the hand  
held device.

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# BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of this invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objects, and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

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FIG. 1 depicts a schematic diagram illustrating a hardware configuration of a hand held device, in accordance with preferred embodiments of the present invention;

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FIG. 2 illustrates a high-level block diagram generally illustrative of an electronic couponing method and system configured with a hand held device, in accordance with preferred embodiments of the present invention;

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FIG. 3 depicts a block diagram illustrating additional details of an electronic couponing method and system utilizing a hand held device, in accordance with preferred embodiments of the present invention;

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FIG. 4 illustrates a high-level block diagram illustrating a wireless electronic couponing method and system utilizing a wireless hand held device, in accordance with preferred embodiments of the present invention;

FIG. 5 depicts a block diagram illustrative of an electronic couponing method and system, in accordance with preferred embodiments of the present invention;

FIG. 6 illustrates a block diagram illustrative of an alternative electronic couponing method and system, in accordance with preferred embodiments of the present invention;

FIG. 7 depicts a block diagram illustrating the implementation of a coupon manager module at a retail point of sale, in accordance with preferred embodiments of the present invention;

FIG. 8 illustrates a block diagram illustrating the implementation of a credit manger module at a retail point of sale, in accordance with preferred embodiments of the present invention;

FIG. 9 depicts a block diagram illustrating the implementation of credit manager, coupon manager, product manager, and accounting modules located away  
5 from the retail point of sale, in accordance with preferred embodiments of the present invention;

FIG. 10 illustrates a block diagram illustrating the implementation of credit manager, coupon manager,  
10 product manager, and accounting modules outside a retail point of sale, in association with a hand held device configured as a PDA, in accordance with preferred embodiments of the present invention;

FIG. 11 illustrates a block diagram illustrating the implementation of credit manager, coupon manager,  
15 product manager, and accounting modules located outside the retail point of sale, in association with a hand held device configured as a PDA integrated with an optical scanner, in accordance with preferred  
20 embodiments of the present invention;

FIG. 12 illustrates a block diagram illustrating the implementation of credit manager, coupon manager,  
25 product manager, and accounting modules located away

from the retail point of sale, in association with a hand held device configured as a wireless telephone, in accordance with preferred embodiments of the present invention;

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FIG. 13 depicts a system diagram illustrating an electronic coupon and credit management system, in accordance with preferred embodiments of the present invention;

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FIG. 14 illustrates an alternative system diagram illustrating an electronic coupon and credit management system, in accordance with preferred embodiments of the present invention;

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FIG. 15 depicts an alternative system diagram illustrating an electronic coupon and credit management system, in accordance with preferred embodiments of the present invention;

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FIG. 16 illustrates an alternative system diagram illustrating an electronic coupon and credit management system, in accordance with preferred embodiments of the present invention;

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FIG. 17 depicts an alternative system diagram illustrating an electronic coupon and credit management system, in accordance with preferred embodiments of the present invention;

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FIG. 18 illustrates an alternative system diagram illustrating an electronic coupon and credit management system, in accordance with preferred embodiments of the present invention;

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FIG. 19 depicts an alternative system diagram illustrating an electronic coupon and credit management system, in accordance with preferred embodiments of the present invention;

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FIG. 20 illustrates an alternative system diagram illustrating an electronic coupon and credit management system, in accordance with preferred embodiments of the present invention;

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FIG. 21 depicts a flow-chart of operations illustrating general procedural steps for implementing hand held device operations, in accordance with preferred embodiments of the present invention;

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FIG. 22 illustrates a flow-chart of operations illustrating detailed procedural steps for implementing hand held device operations, in accordance with preferred embodiments of the present invention;

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FIG. 23 depicts a flow-chart of operations illustrating additional procedural steps for carrying out hand held device operations, in accordance with preferred embodiments of the present invention;

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FIG. 24 illustrates a flow-chart of operations illustrating procedural steps for carrying out point of sale (POS) operations, in accordance with preferred embodiments of the present invention;

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FIG. 25 depicts a flow-chart of operations illustrating procedural steps for carrying out both hand device and point of sale (POS) operations, in accordance with preferred embodiments of the present invention;

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FIG. 26 illustrates a flow-chart of operations illustrating procedural steps for carrying out customer and retail operations, in accordance with preferred embodiments of the present invention;

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FIG. 27 depicts a flow-chart of operations illustrating steps for implementing a credit manager module, in accordance with preferred embodiments of the present invention;

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FIG. 28 illustrates an entity diagram illustrating possible attributes for a wireless network, in accordance with preferred embodiments of the present invention;

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FIG. 29 depicts a block diagram illustrating the interaction of a wireless network, a hand held device, and cash management modules, in accordance with preferred embodiments of the present invention;

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FIG. 30 illustrates a block diagram of a hand held device, in accordance with preferred embodiments of the present invention;

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FIG. 31 depicts a block diagram of a hand held device configured with an optical scanner module and optical scanner, in accordance with preferred embodiments of the present invention;

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FIG. 32 illustrates a block diagram illustrative of

a client/server architecture, in accordance with preferred embodiments of the present invention;

FIG. 33 depicts a detailed block diagram of a client/server architecture in accordance with preferred  
5 embodiments of the present invention;

FIG. 34 illustrates a block diagram of a computer network in which a preferred embodiment of the present  
10 invention can be implemented;

FIG. 35 depicts a flow chart of operations outlining general method steps for processing electronic coupons through hand held devices, in accordance with  
15 preferred embodiments of the present invention;

FIG. 36 illustrates a system diagram illustrative of a system for processing electronic coupons through hand held devices, including modules thereof, in  
20 accordance with preferred embodiments of the present invention;

FIG. 37 depicts an alternative system diagram illustrative of a system for processing electronic  
25 coupons through hand held devices, including modules

thereof, in accordance with preferred embodiments of the present invention;

FIG. 38 illustrates a hand held device configured  
5 with a smart card adapted for use with the hand held device, in accordance with preferred embodiments of the present invention;

FIG. 39 depicts a side view of the hand held device  
10 depicted in FIG. 38 and a slot for inserting smart card into the hand held device, in accordance with preferred embodiments of the present invention; and

FIG. 40 illustrates a hand held device configured  
15 with a smart card adapted for use with the hand held device and a scanner integrated with the hand held device, in accordance with preferred embodiments of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

FIG. 1 depicts a schematic diagram illustrating a  
5 general hardware configuration of a hand held device 11,  
in accordance with an embodiment of the present  
invention. Those skilled in the art can appreciate,  
however, that other hardware configurations may be  
utilized, and are further described herein, to implement  
10 hand held device 11. CPU 10 of hand held device 11,  
acts as a main controller operating under the control of  
operating clocks supplied from a clock oscillator (OSC)  
13. CPU 10 may be configured as a 16-bit  
microprocessor. External pins of CPU 10 are generally  
15 coupled to an internal bus 26 so that it may be  
interconnected to respective components via internal bus  
26.

SRAM 24 can be configured as a writeable memory  
20 that does not require a refresh operation and can be  
generally utilized as a working area of CPU 10. SRAM  
(Static RAM) is generally a form of semiconductor memory  
(RAM) based on a logic circuit known as a flip-flop,  
which retains information as long as there is enough  
25 power to run the device. Font ROM 22 can be configured

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as a read only memory for storing character images (e.g., font) displayable on a liquid crystal (LCD) panel 18.

5 CPU 10 of the present embodiment drives LCD display 18 utilizing, among other media, font images from Font ROM 22. EPROM 20 may be configured as a read only memory that is generally erasable under certain conditions and can be utilized for permanently storing  
10 control codes for operating respective hardware components and security data, such as a serial number.

IR controller 14 can be generally configured as a dedicated controller for processing an infrared code  
15 transmitted/received by an IR transceiver 16 and for capturing the same as computer data. Wireless controller 17 can be generally configured as a dedicated controller and transceiver for processing wireless RF data transmitted from and to a wireless communications  
20 network.

Port 12 can be connected to CPU 10 and can be temporarily attached, for example, to a docking station to transmit information to and from hand held device 11  
25 to other devices, such as personal computers, retail

cash registers, electronic kiosk devices, and so forth.

Port 12 can also be configured, for example, to link with a modem, cradle or docking station, which are well known in the art, that permit network devices, a personal computer or other computing devices to communicate with hand held device 11.

User controls 32 permit a user to enter data to hand held device 11 and initiate particular processing operations via CPU 10. In addition, CPU 10 may cause a sound generator 28 to generate sounds of predetermined frequencies from a speaker 30.

Those skilled in the art can appreciate that additional electronic circuits or the like other than, or in addition to, those illustrated in FIG. 1 may be required to construct hand held device 11. Such components, however, are not described in the present specification, because they are well known in the art.

Those skilled in the art can thus appreciate that because of the brevity of the drawings described herein, only a portion of the connections between the illustrated hardware blocks is generally depicted. In addition, those skilled in the art will appreciate that hand held device 11 can be implemented as a specific

type of a hand held device, such as a Personal Digital Assistant (PDA), paging device, WAP-enabled mobile phone, and other associated hand held computing devices well known in the art.

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When PDAs are deployed, such PDA devices can be further configured with both wireless and wireline communications capabilities, such as those found in cellular telephone units, in accordance with carrying out embodiments of the present invention. Examples of PDA devices that can be utilized in accordance with the method and system of the present invention include the "PalmPilot" PDA, manufactured and sold by Palm Computing, the Handspring Visor, the IBM Workpad, WINDOW CE compatible devices, RIM Blackberry-family paging devices, Motorola paging devices, and the Symbol SPT-family of PDA-type organizer devices. Hand held devices may be also configured with optical scanning/capturing capabilities, in accordance with embodiments of the present invention, which will be further described below.

FIG. 2 illustrates a high-level block diagram generally illustrative of an electronic couponing method and system configured with a hand held device 40, in



accordance with preferred embodiments of the present invention. Hand held device 40, which can be configured as a PDA or other hand held device, communicates with network 38. Network 38 communicates with a coupon database 36. Coupon data maintained in coupon database 36 can be retrieved by hand held device 40 through network 38.

Those skilled in the art can appreciate that although hand held device 40 is generally illustrated as a PDA in FIG. 2, hand held device 40 can be implemented as a wireless application protocol (WAP) web-enabled cellular telephone, or pager or a combination thereof. Hand held device 40 can also be configured as a combination cellular phone/PDA device. One example of such a device is the Handspring™ palmtop and associated cellular phone attachment, which is manufactured and sold by Handspring Inc. Other such devices include the Palm-Motorola phone, which permits users to access e-mail and store calendars and contact databases.

Thus, according to FIG. 2, electronic coupon data can be stored in coupon database 36. Those skilled in the art can appreciate that such electronic coupons represent one type of negotiable economic credit. Thus,

the method and system described herein can apply to the processing of other negotiable economic credits, such as enterprise credits/awards (e.g., frequent flyer miles). Such negotiable economic credits can also be implemented  
5 in the form of what has been referred to as electronic cash or currency (i.e., "e-cash"). It should be understood by those skilled in the art that negotiable economic credits can be implemented as actual electronic currency requiring little or no third-party intervention  
10 for redemption, or may be implemented in the form of data needed to negotiate a credit transaction with a third-party and a retailer on behalf of a hand held device.

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15 A user can thus access coupon database 36 through network 38. Data can be transmitted to and from network 38, as illustrated by arrow 44. Data can also be transmitted to and from coupon database 36 to network 38, as indicated at arrow 42. Communication between  
20 network 38 and hand held device 40 can occur through wireless transmission or direct wireline connections, such as a PDA docking station or cradle. The user thus transmits a request to network 38 to retrieve coupon data from coupon database 36.

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Network 38 can thereafter access and retrieve the requested data from coupon database 36 and transmits such data to hand held device 40, in response so user input at hand held device 40. The coupon data can then  
5 be stored and/or displayed within a display area of hand held device 40 in the form of one or more electronic coupons which can be redeemed for price discounts at retail establishments associated with such electronic coupons.

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An electronic coupon can be configured as a token, issued by or under the authority of the issuer for the benefit of the recipient. Typically, the recipient receives the electronic coupon and subsequently redeems  
15 it for the prescribed benefit at some later point in time. Such an electronic coupon can enable or modify an anticipated transaction, such as providing a discount in the price of goods or services provided by the issuer or the issuer's agent.

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In addition, such an electronic coupon can enable or modify the level of access to privately held information or a server having restricted access. Alternatively, the electronic coupon can be utilized in  
25 transactions between two businesses, two governmental

agencies or two governments wherein, for example, the businesses enter into an agreement relating to a transaction for goods or services or access to information, or the governmental bodies enter into an  
5 agreement relating to transactions regarding currency or information.

The electronic coupon may be stored and retrieved in the form of coupon data. Such coupon data may be  
10 composed of a data structure, which can include any or all of the following information elements: data representative of an electronic coupon serial number or identification number, data representative of a unique key that can be utilized to validate or authenticate the  
15 coupon, data representative of the vendor that authorized the coupon and will redeem the coupon, data representative of the nature of the discount or access provided by the coupon, data representative of the server or entity that issued the coupon.

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In one preferred embodiment of the present invention, the electronic coupon contains all the information necessary to redeem the coupon. Specifically, the electronic coupon identifies the  
25 grantor (i.e., the party of vendor that will redeem the

electronic coupon), the nature of the discount or benefit provided and a unique serial number or other data structure that permits the electronic coupon to be authenticated or validated. Thus, POS-based identifying hardware and software and/or a server redeeming this type of electronic coupon can obtain all the information necessary to redeem from the electronic coupon. Such a server can even include the software necessary to authenticate or validate the electronic coupon (e.g., the coupon manager described herein).

In an alternative embodiment of the present invention, the electronic coupons described herein can be issued as part of an electronic coupon book. The coupon book can include data representative of a version number for the electronic coupon book and data representative of a serial number or identification number for the electronic coupon book. Such an electronic coupon book can be configured to include a unique serial number or identification number and a data structure useful for authenticating or validating the electronic coupon book. In order to redeem this type of electronic coupon, a server and/or coupon manager at a POS, which intends to redeem the electronic coupon must connect to an authentication server which authenticates

or validates the coupon book and indicates the nature of the benefit of the electronic coupon to the server or coupon manager requesting authentication/validation.

5        FIG. 3 depicts a block diagram 47 illustrating additional details of an electronic couponing method and system utilizing a hand held device 40, in accordance with preferred embodiments of the present invention. In FIG. 3 and FIG. 4 like parts are indicated by like  
10 numbers. Thus, block diagram 47 of FIG. 4 is generally analogous to block diagram 34 of FIG. 3. Hand held device 40 can communicate with a retail checkout station 46 via a docking station 48. Docking station 48 can be configured as a PDA cradle for communicating with retail  
15 checkout station 46. Docking station 48 can be implemented as a wired or wireless docking station, or a combination thereof.

Docking station 48 and retail checkout station 46  
20 are linked, such that data can be transferred from hand held device 40 to retail checkout station 46. Retail checkout station 46 can communicate with network 38, which in turn can access coupon database 36 to retrieve coupon data. Coupon data can be retrieved from coupon  
25 database 36 and transferred through network 38 to retail

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checkout station 46. The coupon data can then be transferred from retail checkout station 46 through docking station 48 to hand held device 40.

5 It should be appreciated in the art that synchronization as described throughout disclosure herein refers generally to communication for the purpose of transferring and/or comparing data. During a synchronization of hand held device 40 with retail  
10 checkout station 46, coupon data can be transferred from hand held device 40 to retail checkout station 46. Such coupon data can be then compared against prices of scanned products at the retail checkout station to determine if product discounts can be calculated, based  
15 on particular coupon data transferred from hand held device 40 to retail checkout station 46 through docking station 48. Alternatively, during a transaction at retail checkout station 48 in which coupon data can be transferred to retail checkout station 46 from hand held  
20 device 40, new coupon data can be retrieved from coupon database 36 via network 38 and transferred to retail checkout station 46 and thereafter to hand held device 40.

25 FIG. 4 illustrates a high-level block diagram 50

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illustrating a wireless electronic couponing method and system utilizing a wireless hand held device 40, in accordance with preferred embodiments of the present invention. In FIG. 2, FIG. 3, and FIG. 4, analogous parts are indicated by identical reference numerals. Thus, hand held device 40 can retrieve coupon data (i.e., electronic coupons) from coupon database 36 through a wireless local computer network, such as, for example, a Personal Area Network (PAN). As indicated in FIG. 4, coupon data may be transferred from hand held device 40 through local wireless network 38 to coupon database 36.

An example of one type of PAN that may be utilized in accordance with preferred embodiments of the present invention is "Bluetooth," a telecommunications standard well known in the wireless networking arts. "Bluetooth" is generally known as a telecommunications standard adopted by a consortium of wireless equipment manufacturers referred to as the Bluetooth Special Interest Group (BSIG). *Bluetooth* can be utilized as a global standard for low cost wireless data and voice communications.

A current specification for the *Bluetooth* standard



includes a 2.4 GHz ISM frequency band. *Bluetooth* is generally based on a short-range radio transmitter/receiver capability built into small application specific circuits (ASICs) and embedded into support devices. A *Bluetooth*-enabled device generally has 1mw of transmitter power and is generally capable of asymmetrical data transfers of up to 721 Mbps over distances of 10M. *Bluetooth* permits up to 100 mw of power, which increases frequency hopping of up to 1600 hops per second.

FIG. 5 depicts a block diagram 70 illustrative of an electronic couponing method and system, in accordance with preferred embodiments of the present invention. According to FIG. 5, hand held device 72 retrieves a coupon or coupons (i.e., electronic coupons) in the form of electronic data from network 60. Hand held device 70 can communicate with a point of sale (POS) 88 at a retail establishment through a variety of mechanisms, such as docking station 64, infrared communications unit 68 or through a local RF wireless network 71, such as the *Bluetooth*-type local wireless network described herein.

POS 88 receives or transmits data at input/output

unit 74. Thus, any coupon data transferred from hand held device 72 can be transferred to POS 88 through input/output unit 74. Items purchased at the retail establishment are scanned at POS 88 utilizing a scanner 5 86 that can read and store, for example, scanned UPC codes. Those skilled in the art can appreciate that although scanner 86 is generally presented herein for purposes of describing a particular embodiment of the present invention, other types of scanning devices, 10 e.g., bar code scanners, may also be utilized in place of scanner 86. For example, scanning devices that utilize holographic scanning configurations or RF Tags can also be utilized to scan product information.

15 Product data (e.g., product prices) obtained as a result of scanning purchased items may be transferred to CPU 78 for processing with coupon data received from hand held device 72 at input/output unit 74. The coupon data transferred from hand held device 72 contains 20 electronic coupons associated with particular products offered by the retail establishment. A product database containing product data may be linked to CPU 78. A coupon database 82 from which coupon data can be stored and retrieved may be also linked to CPU 78.

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CPU 78 compares the price of scanned products/items based on product data stored in product database 84 with the discounted price associated with user provided coupon data. If a matching product is identified in product database 84, CPU 78 subtracts the discounted price from scanned product price. When scanning is complete, CPU provides a total price, which includes coupon discounts and displays this total price at display 76 for the user to view. Thereafter, new coupon data can be retrieved from coupon database 82 by CPU 78 and transmitted to hand held device 71 through input/output unit 74. New coupon data may be used, for example, for future transactions.

15 The coupon data originally transferred from hand held device 72 can be flagged and stored in coupon database 82 to indicate that such coupon data has already been utilized in a transaction at the retail establishment by the user of the hand held device 72.

20 Such a flagging operation ensures that the user can only utilize the coupon data for a single purchase transaction. In addition, the coupon data retrieved from hand held device 72 and utilized during a purchase transaction can be deleted from the hand held device 72

25 during a synchronization of hand held device 72 and POS

88. CPU 78 can be instructed to generate and transmit a message to hand held device 72 during synchronization to indicate that the electronic coupons retrieved from hand held device 72 and utilized during the purchase transaction has been successfully utilized to discount products scanned by scanner 86 or another scanning device (e.g., holographic scanner, RF tags) utilized in accordance with preferred embodiments of the present invention.

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In FIG. 5 to FIG. 12, analogous parts are indicated by identical reference numerals. Those skilled in the art will appreciate that the block diagrams illustrated in FIG. 5 to FIG. 12 herein represent alternative preferred embodiments of the present invention and that similar parts may be utilized to implement such alternative preferred embodiments. Thus, FIG. 6 illustrates a block diagram 90 illustrative of an alternative electronic couponing method and system, in accordance with preferred embodiments of the present invention.

Block diagram 90 of FIG. 6 is generally similar to block diagram 70 of FIG. 5, the difference evident in the addition of an accounting module 80, which interacts

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with POS 92 to keep track of purchase transactions, including coupon synchronizations with hand held devices and discounted prices thereof, that occurred at the POS 92 during a particular period of time, such as for example, a twenty-four period or during a particular shift. Accounting module 80, as illustrated in block diagram 90 of FIG. 6, is generally depicted outside the bounds of POS 92. CPU 78 can be linked to accounting module 80 through a wireless or direct link or through a network. Although not illustrated in FIG. 6, those skilled in the art can appreciate that accounting module 80 can be incorporated at the POS as a program product controlled by CPU 80. Accounting data can then be retrieved for use by accounting personnel/resources of the enterprise.

FIG. 7 depicts a block diagram 96 illustrating the implementation of a coupon manager 83 at a retail POS, in accordance with preferred embodiments of the present invention. Coupon manager 83 can be implemented as a software module located in a memory location of an authentication server, which includes software necessary to authenticate electronic coupons prior to their redemption. Likewise, coupon manager 83 can function as the authentication agent for authenticating coupons

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prior to their redemption. Operational and system components depicted in FIG. 5 and FIG. 6 herein are analogous to the operational and system components illustrated in FIG. 7. Block diagram 96 of FIG. 7, however, additionally includes a coupon manager module (i.e., coupon manager 83) in communication with coupon database 82 and CPU 78.

Coupon Manager 83 also can communicate with accounting module 80, whether at the POS 94 or elsewhere, and product manager 87. Product manager 87 can communicate with product database 84, coupon manager 83, accounting module 80, and CPU 78.

Coupon manager 83 may be implemented as a software module that instructs CPU 78 to retrieve coupon data from hand held device 72 during a synchronization with hand held device 72. Coupon manager 83 can also instruct CPU 78 to transmit data back to hand held device 72 during a synchronization with hand held device 78. In addition, coupon manager 78 can instruct CPU 78 to subtract price discounts associated with retrieved coupon data from prices associated with purchased items scanned with scanner 86.

Coupon manager 83 may also retrieve new coupons from coupon database 82 that may be provided through the POS 94 to hand held device 72 for use during future purchases. Thus, coupon manager 83 provides product  
5 pricing and identification information based on, for example, UPC information retrieved from a scanned product by bar code scanner 86. Pricing information can be utilized by CPU 78 to render a subtotal of items purchased (i.e., "subtotal" meaning prior to coupon  
10 deductions).

Information related to products retrieved from product database during scanning may be also utilized to associate the scanned product to the coupons retrieved  
15 as coupon data from hand held device 72. If scanned products match the coupons retrievable from hand held device 72, then a new total may be rendered based on the value of the coupons subtracted from the subtotal, and the matching coupons are retrieved from hand held device  
20 72 for the retail establishment to obtain their credit due from associated product distributors.

FIG. 8 illustrates a block diagram 100 illustrating the implementation of a credit manger 80 at a retail  
25 POS, in accordance with preferred embodiments of the

present invention. Credit manager 80 may be configured as a software module that retrieves credit data (i.e., credits or awards associated with retail/commercial transactions) from a credit database 81. Credit manager  
5 80 can be configured to communicate with CPU 78, coupon manager 83, and product manager 87.

In addition, credit manager 85 can communicate with accounting module 80. Again, those skilled in the art  
10 will appreciate that accounting module 80 can be configured at the POS 102 or at another location and linked to CPU 78 via a network link. Initially, items are scanned at POS 102. Hand held device 72 may be synchronized with POS 102 through input/output 74 and  
15 possible interfacing mechanisms, such as docking station 64, infrared communications unit 68 or through local wireless network 71.

Credit manager 85 can be initialized in response to  
20 synchronization between hand held device 72 and POS 102 and/or in response to item scanning. Credit manager 85 accesses credit database 81 and determines associations between scanned items and credit or point information accessed from credit database 81. If a matching  
25 association may be identified, credit manager 85

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retrieves credits from credit database 81. Credit manager 85 then instructs CPU 78 to process these credits, which are then transferred by CPU 78 through input/output unit 74 to hand held device 72.

5

The credits can be then stored in a database associated with hand held device 72 for later retrieval by hand held device 72. When a certain number of credits are earned by the user of hand held device 72 following a particular number of transactions, the user can be eligible to receive discounts on future purchased items, or discounts or awards of products or services offered by other establishments or enterprises that have business alliances in place with the retail establishment or organization through which the credits were earned by the user.

FIG. 9 depicts a block diagram 100 illustrating the implementation of credit manager 85, coupon manager 83, product manager 87, and accounting module 80 located away from the retail POS 102, in accordance with preferred embodiments of the present invention. POS 102 includes CPU 78 connected to input/output unit 74, display 76, and scanner 86. Unlike POS 102 of FIG. 8, POS 102, as illustrated in FIG. 9, may be configured to

communicate with credit manager 85, coupon manager 83,  
product manager 87, and accounting module 80 indirectly  
rather than directly at POS 102. Those skilled in the  
art can thus appreciate that block diagram 100 of FIG. 9  
5 may be simply an alternative preferred embodiment of the  
configuration depicted in FIG. 8. The various described  
modules can be incorporated into POS 102 at, for  
example, a cash register or cash register/scanning  
system, or can be implemented as software modules  
10 residing in computer memory in a remote computer network  
linked to POS 102.

FIG. 10 to FIG. 12 illustrate alternative preferred  
embodiments of the present invention that utilize  
15 various types of hand held devices. In FIG. 10 to FIG.  
12, analogous parts are indicated by like reference  
numerals. Thus, FIG. 10 illustrates a block diagram 100  
illustrating the implementation of credit manager 85,  
coupon manager 83, product manager 87, and accounting  
20 module 80 located away from the retail POS 102, while  
credit database 81, coupon database 82 and product  
database 84 are configured to operate at POS 102.

In FIG. 10, hand held device 73 may be configured  
25 as a PDA, in accordance with preferred embodiments of

the present invention. A "PDA" may include a two-way  
paging device, such as the Blackberry-family of paging  
devices manufactured by RIM or SmartPhones proposed by  
numerous wireless industry manufacturers. Hand held  
5 device 73 of FIG. 10 may be configured as a PDA having  
wireless or wireline communications capabilities or a  
combination thereof, thus communicating with POS 102  
through local wireless network 71, infrared (IR/IRF)  
communications unit 68 or docking station 64.

10

FIG. 11, on the other hand, illustrates a hand held  
device 77 configured as a PDA integrated with an optical  
scanner, in accordance with preferred embodiments of the  
present invention. In FIG. 11, credit manager 85,  
15 coupon manager 83, product manager 87, and accounting  
module 80 are illustrated outside the retail point of  
sale, in association with hand held device 77. Hand  
held device 77 may be configured with an optical scanner  
that can scan coupon data and electronic coupons thereof  
20 from a static reference or representation, such as a  
newspaper, magazine, and so forth.

Optical scanner 59 thus retrieves coupons 62 from  
static reference 57 by scanning or capturing electronic  
25 coupon data or other associated data (e.g., product

data). In the case of a bar code reader, the electronic coupons (e.g., coupon data) are scanned. In the case of an optical reader with capturing capabilities, images representatives of coupons or coupon data are captured.

5 The coupons (i.e. coupon data) are stored in a database within hand held device 77 for eventual redemption at POS 102. Such a data may be referred to as a *hand held device coupon database*.

10 Finally, FIG. 12 depicts a hand held device configured as a wireless telephone 79, in accordance with preferred embodiments of the present invention. Those skilled in the art can appreciate, of course, that such hand held devices can be configured to combine each  
15 of the primary features of a PDA, pager, and wireless and/or cellular telephone.

In FIG. 13 to FIG. 14, analogous parts are indicated by identical reference numerals. FIG. 13 thus  
20 depicts a system diagram 130 illustrating an electronic coupon and credit management system, in accordance with preferred embodiments of the present invention. POS 140 may be linked to coupon manager 142 and credit manager 144. Coupon manager 142 is generally analogous to  
25 coupon manager 83 of FIG. 7 to FIG. 12. Credit manager

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144 is generally analogous to credit manager 85 of FIG. 8 to FIG. 12 herein. POS 140, coupon manager 142, and credit manager 144 together comprise retail portion 138 of the electronic coupon and credit management system outlined in system diagram 130. POS 140 is generally analogous to POS 88, 92, 94, and 102 illustrated in FIG. 5 to FIG. 12 herein.

A security module 152 can be linked to POS 140 to provide secure firewall protection (i.e., security 152).

A *firewall*, well-known in the networking and computer arts, can be configured as a security module that protects an organization's network against external threats, such as hackers, coming from another network, such as the *Internet*. Firewalls prevent computers or other computing devices within a particular network from communicating directly with computers or other devices, such as hand held device 132, external to the network and vice versa. Instead, all communications are generally routed through a proxy server outside of the organizational network, and the proxy server determines if it is safe to let a particular message or data pass through to the network.

In the configuration illustrated in FIG. 13, retail

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portion 138 may include a variety of POS devices (e.g., cash register/scanning systems) linked with computers and servers to provide a local enterprise network. As such, any communication with such a network may be  
5 filtered through a security module, such as security module 152. Those skilled in the art can appreciate that coupon manager 142 and credit manager 144 can be incorporated, separately or in combination, directly with point of sale 140 or may be linked to point of sale  
10 140 through a network link, either wireless- or wireline-based.

Hand held device 132 can communicate with a transaction broker 148 and a third-party provider 156 of  
15 coupons/credits. Communication between hand held device 132, transaction broker 148, and third party provider 156 can occur utilizing a network 134 linked to a security module 136. Security module 136 can be configured as a firewall, as described herein.  
20 Transaction broker 148 and third-party provider can be configured as software modules residing in computer memory in a remote computer network, such as the Internet, or other networked configurations.

25 Network 134 can be configured as a remote computer

network, such as the Internet, or a dedicated local network. Third-party provider 156 may be linked to a provider database 158, and transaction broker 148 may be linked to a user profile database contain user profile  
5 data. User profile database 150 and transaction broker 148 together form a transaction broker portion 146 of system diagram 130. Provider database 158 and third-party provider 156 together comprise a third-party provider portion 154 of system diagram 130.

10

If a user desires to obtain electronic coupons to store in hand held device 132, the user can communicate with transaction broker 148 or third-party provider 156 through a network 134. Data transmitted through network  
15 134 to transaction broker 148 or third party provider 156 may be filtered through the firewall provided by security module 136. Transaction broker 146 may be a module that can manage credits and coupons transmitted between all parties depicted in FIG. 13, including  
20 retail portion 138, third-party provider 156, and hand held device 132.

A user can access third-party provider 156 directly through network 134 and security module 136 in order to  
25 retrieve coupons provided by third-party provider 156.

Third-party provider 156 can be, for example, an organization or enterprise allied with a retail establishment or enterprise associated with POS 140. Retail portion may, for example, be associated with a grocery chain or shopping mall. Third-party provider 156 may, for example, be an airline company offering coupons or airline credits. Third-party provider 156 can communicate with retail portion 138 through a network 160, which again, may simply be the Internet or a dedicated network configured between POS 140 and third-party provider portion 154.

Coupons and associated third-party provider information can be stored in provider database 158 and retrieved by third-party provider 156 for transmission to hand held device 132. Likewise, a user of hand held device 132 can access transaction broker 148 to download electronic coupons to hand held device 132 through security module 136 and network 134. The coupons are provided by transaction broker 148 to hand held device 132 based on a user profile that a user of hand held device 132 previously submitted to transaction broker 148. Thus, coupons transmitted by transaction broker 148 to hand held device 132 may be based on the user's preferences as indicated in an associated user profile



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stored in the user profile database 150. A user profile may be configured and/or obtained through a network by/from a hand held device 132, or a profile may be set up by a user at broker 148. Initial profile set up at  
5 the broker may be via a networked hand held device, personal computer or other means known in the art (e.g., telephonically). Thereafter, coupon retrieval from broker 148 may be by the hand held device 132, networked computer, POS 102 on behalf of the hand held device 132  
10 user. In most situations, however, coupon retrieval will be from a broker 148 to the hand held device 132, and then from the hand held device 132 to the POS 102.

Third-party provider 156 can also provide credit  
15 information to the retail establishment associated with POS 140 through network 160, thereby enabling credit manager 164 to maintain and handle transactions involving hand held device 132 and point of sale 138. The user of hand held device must, of course, have  
20 previously registered to receive such credits from third-party provider 156 either directly or with third-party provider 156 or indirectly through transaction broker 148.

25 FIG. 14 illustrates an alternative system diagram.

164 illustrating an electronic coupon and credit management system, in accordance with preferred embodiments of the present invention. As indicated earlier, in FIG. 13 and FIG. 14, like parts are  
5 indicated by identical reference numerals. As illustrated in system diagram 164, additional networks can be provided which permit hand held device 132 to communicate with transaction broker 148 or third-party provider 156.

10

A user can retrieve electronic coupons to be stored in hand held device 132 from a coupon source 162. Coupon source 162 may simply be a web site displayed via the Internet from which coupon data may be downloaded,  
15 or coupon source 162 may simply be an implementation of third-party provider 156. Coupon source 162 may also be a static reference, such as a bar code or graphical representation of a coupon printed on a newspaper or magazine. In such a case, the bar code or graphical  
20 representation may be associated with one or more electronic coupons.

An optical reader, such as a bar code scanner or other scanning device, can be integrated with a hand  
25 held device, such as a PDA or other hand held devices

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described herein, to retrieve electronic coupons from such a static reference. The static reference may be composed of coupon data representative of electronic coupons themselves that can be redeemed through a hand held device in accordance with the method and system described herein. The static reference may be also configured as data readable by an optical scanning device.

Such data can refer the user of the hand held device to an Internet "web" page containing electronic coupons retrievable by the hand held device. Such a static reference can be configured as a 12-digit number in UPC Coupon Code format. In this format, the first digit is a 5, designating a coupon. The next five digits may represent a manufacturer ID. The next 3 digits are a family code. The next 2 digits represent a value code. The last digit may be a check digit. The hand held device, such as a PDA, can additionally be configured with a holographic scanning device that optically reads holographic data embedded on print, magazine, cloth, or other physical material.

Coupon source 162 thus illustrates the fact that coupon data (i.e., electronic coupons) are available for

retrieval by hand held device 162 as indicated herein.

Network 137 can be utilized to transmit data between security module 136 and transaction broker 148. Those skilled in the art can appreciate that network 137 may be analogous to network 134 (i.e., the two networks may be the same network) or the network may be a stand-alone network linked to security module 136 and transaction broker 148. Network 137 may also be a remote computer network, such as the Internet, from which data can be retrieved and transmitted.

Likewise, network 135 can be implemented as a dedicated or stand alone network linking security module 136 with a security module 157, or network 135 may simply be a remote computer network, such as the Internet. Security module 157 may be configured as firewall linked with third-provider 156 to provide additional protection to third-party provider 156 and its associated provider database 158. Security module 157, and other similar security modules described and illustrated herein, may be also configured with encryption/decryption routines or subroutines that protect the security of data transferred from or to such security modules. Additionally, such security modules

may be also configured with password protection routines or subroutines to provide additional security for users.

FIG. 15 depicts an alternative system diagram 165 illustrating an electronic coupon and credit management system, in accordance with preferred embodiments of the present invention. FIG. 14 and FIG. 15 are similar, with the exception of an additional network 149 located between security module 157 and coupon source 162. FIG. 15 merely demonstrates the fact that coupon data may be provided by third-party provider 156 through network 149 to hand held device 162 and thereafter redeemed during a transaction involving hand held device 132 at POS 140.

Again, network 149 may be composed of a dedicated network linking coupon source 162 and third-party provider portion 154 or simply the Internet. In such a case 162, coupon source 162 can be configured as a web site operated by an organization or enterprise associated with third-party provider 156.

FIG. 16 illustrates an alternative system diagram 167 illustrating an electronic coupon and credit management system, in accordance with preferred embodiments of the present invention. System diagram

167 of FIG. 16 is generally similar to system diagram 165 of FIG. 15, with the exception of a network located between security module 157 and transaction broker 148.

Transaction broker 148 can thus communicate with third-party provider 156 through network 172 and security module 157 to retrieve instructions, coupon data, credit data, and other appropriate information from third-party provider 156. Such information can then be provided to a user of hand held device 162 by transaction broker 148. Again, network 172 may be configured as a dedicated network linking security module 157 to transaction broker 148, or network 172 may simply be a remote computer network, such as the Internet.

FIG. 17 depicts an alternative system diagram 169 illustrating an electronic coupon and credit management system, in accordance with preferred embodiments of the present invention. System diagram 169 of FIG. 16 is generally similar to system diagram 167 of FIG. 16 with the exception of an additional network 176 that permits hand held device 132 to communicate with third-party provider portion 154.

Network 176 may be configured as a dedicated network linked to security module 157. In such a case,

network 176 may simply be a local network located at a third-party provider establishment or premises that can be accessed by hand held device 132. Network 176 may simply be the Internet from which hand held device 176  
5 can download appropriate third-party provider information, including electronic coupons, credit information, and other third-party provider information retrieved by third-party provider 156 from provider database 158.

10

FIG. 18 illustrates an alternative system diagram illustrating an electronic coupon and credit management system, in accordance with preferred embodiments of the present invention. System diagram 171 of FIG. 18 is  
15 generally similar to system diagram 169 of FIG. 17, with the exception that security module 152 may be located with the realm of retail portion 138.

In the previous illustrations, security module 152  
20 was located outside the realm of retail portion 138 to indicate that the firewall or security arm of retail portion 138 can be configured at a location other than POS 140. For example, hand held device 152 may communicate with POS 140 through an electronic kiosk  
25 device located in a building or area away from the point

of sale. Such an electronic kiosk device may be then  
linked via a network to POS 140. Alternatively, as  
illustrated in FIG. 18, security module 152 may be  
configured at the point of sale, depending on the needs  
5 or requirements of the retail establishment or  
enterprise operating POS 140.

FIG. 19 depicts an alternative system diagram 173  
illustrating an electronic coupon and credit management  
10 system, in accordance with preferred embodiments of the  
present invention. System diagram 173 differs from the  
previously illustrated system diagrams in the fact that  
the various portions that make up system diagram 173 and  
hence, the electronic coupon and credit management  
15 system described herein, can communicate with one  
another over a single network 143. Thus, transaction  
broker 148 can communicate with network 143 through  
security module 136.

20 Third-party provider can communicate with network  
143 through security module 157. POS 140 can  
communicate with network 143 through security module  
152. Hand held device 132 can communicate with  
transaction broker portion 146, third party provider  
25 portion 154 and retail portion 138 through network 143.



Those skilled in the art will appreciate that network 143 can be configured as a stand-alone dedicated network or a remote computer network, such as the Internet and associated *World Wide Web*, paging networks and other  
5 Wireless Intelligent Networks (WINS).

FIG. 20 illustrates an alternative system diagram 176 illustrating an electronic coupon and credit management system, in accordance with preferred  
10 embodiments of the present invention. System diagram 179 is generally similar to system diagram 173 of FIG. 19, with the exception that a coupon source 162 may be located between hand held device 132 and network 143 to illustrate the fact that coupons can be retrieved and  
15 stored in hand held device 132 from a coupon source 162 associated with network 143 or simply linked to network 143. Again, coupon source 162 may be configured as a web site from which coupon and credit data may be retrieved. Such a web site can be associated with  
20 transaction broker 146 and/or third-party provider 156 and/or point of sale 140 or retail portion 138.

FIG. 21 depicts a flow-chart of operations 190 illustrating general procedural steps for implementing  
25 hand held device operations, in accordance with

preferred embodiments of the present invention. As illustrated at block 192, the process may be initiated.

A hand held device, such as the hand held devices described and illustrated herein, maintains a coupon management module that instructs a CPU, such as CPU 10 of FIG. 1, to manage the handling of coupon data received by or transmitted from the hand held device. Such a module can be configured as a software module processed at the hand held device, and stored in a memory unit in the hand held device.

As illustrated at decision block 196, a decision may be made, in response to initialization of the hand held device coupon management module, to determine if a coupon should be acquired by the hand held device. If a determination is made not to acquire a coupon, the process terminates, as illustrated thereafter at block 202. If it is determined, however, to acquire a coupon, then as depicted next at block 198, a coupon in the form of electronic coupon data may be acquired from a remote source. Thereafter, as described at block 200, the coupon may be stored in a database in the hand held device associated with the hand held device coupon module. The process then terminates, as indicated at block 202. It should be apparent after the present

teachings that a decision to acquire coupons may be made manually by the user or automatically by the hand held device based on the user's profile, thereby relieving the user of manual coupon acquisition functions.

5

FIG. 22 illustrates a flow-chart of operations 205 illustrating detailed procedural steps for implementing hand held device operations, in accordance with preferred embodiments of the present invention. As illustrated at block 206, the process may be initiated.

As depicted thereafter at block 208, a hand held device having a coupon management module integrated therein communicates with a POS. Thereafter, as depicted at block 210, the hand held device may be synchronized with the POS coupon manager to negotiate a coupon exchange.

It is important to distinguish between the POS coupon manager and the coupon management module integrated or associated with the hand held device. The POS coupon manager is analogous to coupon manager 142 illustrated in FIG. 20. The coupon management module described above may be incorporated with the hand held device and functions as a coupon management module for the hand held device. When negotiation of the coupon exchange is completed, as indicated at block 212,

thereafter, as depicted at block 214, a coupon database associated with the hand held device is reconciled and may also be updated with new coupons. Reconciliation operations remove used coupons and may add new ones to  
5 the device.

Coupons utilized during the coupon exchange are deleted from such a coupon database. Again, such a hand held device coupon database may be distinguished from a  
10 POS associated coupon database, such as, for example, coupon database 82 of FIG. 8. Coupon database 82 of FIG. 8 operates in association with a POS. The hand held device coupon database described above may be integrated with the hand held device and stores coupon  
15 information and related coupon data in the hand held device itself. The process then terminates, as described at block 216. FIG. 30 herein illustrates the interaction of a coupon database and coupon management module associated with a hand held device.

20

FIG. 23 depicts a flow-chart of operations 218 illustrating additional procedural steps for carrying out hand held device operations, in accordance with preferred embodiments of the present invention. As  
25 indicated at block 220, the process may be initiated.

As described thereafter at block 218, a coupon in the form electronic coupon data can be acquired from a store or retail establishment directly through a docking station or through wireless means, such as, for example,  
5 a wireless tag.

Acquisition of such coupon data may be generally handled through the coupon management module associated with the hand held device (e.g., refer to FIG. 30).  
10 Thereafter, the hand held device can communicate with a POS, as indicated at block 222. The hand held device coupon management module may be synchronized with the POS associated coupon manager to negotiate a coupon exchange, as depicted at block 224. Negotiation with  
15 the POS may be then completed, as described at block 226. The process then terminates, as indicated at block 228.

FIG. 24 illustrates a flow-chart of operations 240  
20 illustrating procedural steps for carrying out point of sale (POS) operations, in accordance with preferred embodiments of the present invention. The process may be initiated, as indicated at block 242, and thereafter, as depicted at block 244, purchased items are scanned at  
25 the POS utilizing a scanning device, such as scanner 86

of FIG. 5 to FIG. 12. A subtotal may be then rendered,  
as indicated at block 246.

The POS may be in communication with the hand held  
5 device, as illustrated at block 248, the POS associated  
coupon manager may be synchronized with the hand held  
device coupon management module to negotiate a coupon  
exchange, as indicated at block 250. If applicable, a  
new total may be calculated, as depicted at block 254,  
10 based on the subtraction of coupon discounts from the  
rendered subtotal. A new total may be then rendered, as  
illustrated at 254, which reflects any price discounts  
associated with the coupon data synchronized and  
negotiated during the coupon exchange between the hand  
15 held device and the POS. The process then terminates,  
as described at block 256.

FIG. 25 depicts a flow-chart of operations 260  
illustrating procedural steps for carrying out both hand  
20 device and point of sale (POS) operations, in accordance  
with preferred embodiments of the present invention.  
Hand held device operations are initiated, as  
illustrated at block 262. POS operations are initiated,  
as indicated at block 269. As depicted at block 264,  
25 electronic coupons are the acquired by the hand held

device. The hand held device may be then taken to POS during an item purchase, as illustrated at block 266.

At the POS, the hand held device communicates with the POS by wireless transmission of data or through a dedicated wireline docking station linked with, for example, a cash register/scanning system. As depicted next at block 270, items to be purchased at the retail establishment are scanned at the POS. Thereafter, a subtotal may be rendered, as depicted at block 272. Those skilled in the art can appreciate that such operations may be performed in alternative ordering, as indicated by the dashed connecting arrows in FIG. 25.

Following completion of the operation illustrated at block 272, the POS coupon manager (e.g., coupon manager 83 of FIG. 8) may be synchronized with the hand held device coupon management module (e.g., coupon management module 430 of FIG. 30) to negotiate the coupon exchange. Thereafter, as indicated at block 276 the POS coupon database (e.g., coupon database 82 of FIG. 8) may be reconciled with the hand held device coupon database (e.g., hand held device coupon database 432 of FIG. 30). Hand held device operations then terminate, as illustrated at block 277.

Following completion of the operation described at block 274, a new total may be calculated which takes into account subtracted discounts based on coupons provided to the POS from the hand held device. The new total may be then rendered on, for example, a display screen of a cash register and/or the hand held device itself, as illustrated at block 278. POS operations for the transaction can be then terminated, as depicted at block 280.

FIG. 26 illustrates a flow-chart of operations 290 illustrating procedural steps for carrying out customer and retail operations, in accordance with preferred embodiments of the present invention. A dashed line depicted in FIG. 26 separates customer operations from retail operations in attempt to distinguish between operations that primarily involve the hand held device and operations primarily involving the retail establishment and POS. Thus, as depicted at block 292, the process may be initiated. Thereafter, as described at block 294, a user utilizing a hand held device acquires a coupon.

The hand held device may be then placed in



communication with the POS, as indicated at block 296.  
As illustrated next at block 298, The POS coupon manager  
may be synchronized with the hand held device coupon  
management module. Thereafter, as depicted at block  
5 300, a coupon database associated with the hand held  
device (e.g., hand held device coupon database 432 of  
FIG. 30 and FIG. 31) may be accessed. Coupon data may be  
then retrieved from the hand held device coupon  
database, as illustrated at block 302.

10

Next, as indicated at block 304, a product manager  
correlates coupons retrieved from the hand held device  
with products scanned and to be purchased at the POS.  
Product manager 87 of FIG. 8 represents an example of  
15 such a product manager. Correlating product data may be  
then identified, as indicated at block 306, and  
thereafter, as illustrated at block 308, a new total may  
be calculated by subtracting correlating coupon data. A  
new total may be then rendered, as described at block  
20 310. The process then ends, as illustrated at block  
312.

FIG. 27 depicts a flow-chart of operations 320  
illustrating steps for implementing a credit manager  
25 module, in accordance with preferred embodiments of the

present invention. An example of such a credit manager  
cay be credit manager 144 of FIG. 5 to FIG. 12. A  
credit manager module (or simply "credit manager") may  
be initiated, as illustrated at block 322. An item or  
5 product to be purchased may be scanned at the POS, as  
illustrated at block 323. A hand held device may be in  
communication with the POS, as indicated at block 324  
and thereafter, as depicted at block 326, the credit  
manager associated with the POS (e.g., credit manager 85  
10 of FIG. 8) may be initialized.

In response to initialization of the credit  
manager, as indicated at block 328, the POS credit  
manager accesses a credit database (e.g., credit  
15 database 81 of FIG. 8). As illustrated next at block  
330, the POS credit manager determines associations  
between scanned items and credit information, including  
credits or points, accessed from the credit database.  
Thereafter, as depicted at decision block 332, it must  
20 be determined if any matches are made between scanned  
items and credits/points accessed from the credit  
database.

If a match is not found for a particular scanned  
25 item, then as depicted at block 324, a comparison must

be performed again, as illustrated via connecting symbol 335 and block 330. If, however, a match is identified, the credit manager retrieves credits/points from the credit database, as described at block 336. The credits  
5 are then processed, as illustrated at block 338, and thereafter transferred, as described at block 340, to a credit database associated with the hand held device. Such a hand held device credit database may be integrated with the hand held device itself. The  
10 process may be then terminated, as illustrated at block 348.

FIG. 28 illustrates an entity diagram 400 illustrating possible attributes for a wireless network, in accordance with preferred embodiments of the present  
15 invention. Those skilled in the art can appreciate that wireless network 414 may be utilized in place of or in association with network 143 of FIG. 19 and FIG. 20. Such a wireless network can be utilized to permit a hand  
20 held device, such as hand held device 132 of FIG. 20 to communicate with a POS, third-party provider and/or a transaction broker.

Those skilled in the art can further appreciate  
25 that a variety of possible wireless communications and

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networking configurations may be utilized to implement wireless network 414. Wireless network 414 may be, for example, implemented according to a variety of wireless protocols, including satellite, cellular, and direct RF or IR communications. Satellite communications, for example, well known in the art and can be implemented in combination with a network. A hand held device can communicate with a POS, third-party provider of coupons/credits, retail establishment, or transaction broker to acquire, transmit, and negotiate coupon exchanges through wireless network 414. Wireless network 414 can be implemented as a single network type (e.g., *Bluetooth*) or a network based on a combination of network types (e.g., GSM, CDMA, etc).

15

Wireless network 414 can be configured as a CDPD (Cellular Digital Packet Data) network 413, well-known in the networking arts. CDPD may be configured as a TCP/IP based technology that supports Point-to-Point (PPP) or Serial Line Internet Protocol (SLIP) wireless connections to mobile devices, such as the hand held devices described and illustrated herein. Cellular service is generally available throughout the world from major service providers. Data can be transferred over switched PSTN circuits or packet-switched network

25

utilizing CDPD protocols.

Current restrictions of CDPD are not meant to limit the range or implementation of the method and system described herein, but are described herein for illustrative purposes only. It is anticipated that CDPD will be continually developed, and that such new developments can be implemented in accordance with the present invention.

10

Wireless network 414 can be also configured as a Personal Area Network 402 or *Bluetooth*, as described herein. *Bluetooth* was adopted by a consortium of wireless equipment manufacturers referred to at the Bluetooth Special Interest Group (BSIG), and has emerged as a global standard for low cost wireless data and voice communication. Current specifications for this standard call for a 2.4 GHz ISM frequency band. *Bluetooth* technology is generally based on a short-range radio transmitter/receiver built into small application specific circuits (ASICs) and embedded into support devices, such as the hand held devices described and illustrated herein.

25 The *Bluetooth* standard permits up to 100 mw of

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power, which can increase the range to 100 M. In addition, *Bluetooth* can support up to three voice channels. Utilizing short data packets and frequency hopping of up to 1600 hops per second, *Bluetooth* is a wireless technology that can be utilized to enable the implementation of the method and system described herein. Current restrictions of *Bluetooth* are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated *Bluetooth* will be continually developed, and that such new developments can be implemented in accordance with the present invention.

Wireless network 414 can also be configured as a GSM network 404. GSM (Global System for Mobile Communication) and PCS (Personal Communications Systems) networks, both well-known in the telecommunications arts, generally operate in the 800 MHz, 900 MHz, and 1900 MHz range. PCS initiates narrowband digital communications in the 900 MHz range for paging, and broadband digital communications in the 1900 MHz band for cellular telephone service. In the United States, PCS 1900 is generally equivalent to GSM 1900. GSM operates in the 900 MHz, 1800-1900 MHz frequency bands,

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while GSM 1800 is widely utilized throughout Europe and many other parts of the world.

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In the United States, GSM 1900 is generally  
5 equivalent to PCS 1900, thereby enabling the  
compatibility of these two types of networks. Current  
restrictions of GSM and PCS are not meant to limit the  
range or implementation of the present invention, but  
are described herein for illustrative purposes only. It  
10 is anticipated that GSM and PCS will be continually  
developed, and that such new developments can be  
implemented in accordance with the present invention.

Wireless network 414 can be also implemented as a  
15 GPRS network 406. GPRS technology, well-known in the  
telecommunications arts, bridges the gap between current  
wireless technologies and the so-called "next  
generation" of wireless technologies referred to  
frequently as the third-generation or 3G wireless  
20 technologies. GPRS is generally implemented as a  
packet-data transmission network that can provide data  
transfer rates up to 115Kbps. GPRS can be implemented  
with CDMA and TDMA technology and supports X.25 and IP  
communications protocols, all well-known in the  
25 telecommunications arts. GPRS also enables features,

such as Voice over IP (VoIP) and multimedia services. Current restrictions of GPRS are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that GPRS will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network 414 can be implemented as a CDMA network 408. CDMA (Code Division Multiple Access) is a protocol standard based on IS-95 CDMA, also referred to frequently in the telecommunications arts as CDMA-1. IS-95 CDMA is generally configured as a digital wireless network that defines how a single channel can be segmented into multiple channels utilizing a pseudo-random signal (or code) to identify information associated with each user. Because CDMA networks spread each call over more than 4.4 trillion channels across the entire frequency band, it is much more immune to interference than most other wireless networks and generally can support more users per channel.

Currently, CDMA can support data at speeds up to 14.4 Kbps. Wireless network 414 can also be configured with a form of CDMA technology known as wideband CDMA



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(W-CDMA). Wideband CDMA may be also referred to as CDMA 2000 in North America. W-CDMA can be utilized to increase transfer rates utilizing multiple 1.25 MHz cellular channels. Current restrictions of CDMA and W-CDMA are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that CDMA and W-CDMA will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network 414 can be also implemented as a paging network 410. Such paging networks, well-known in the telecommunications arts, can be implemented in accordance with the present invention to enable transmission or receipt of data over the TME/X protocol, also well-known in the telecommunications arts. Such a protocol enables notification in messaging and two-way data coverage utilizing satellite technology and a network of base stations geographically located throughout a particular geographical region. Paging network 410 can be configured to process enhanced messaging applications.

Unified messaging solutions can be utilized in

accordance with wireless network 414 to permit carriers and Internet service providers to manage customer e-mail, voice messages and fax images and can facilitate delivery of these communications to PDAs, telephony  
5 devices, pagers, personal computers and other capable information retrieval devices, wired or wireless.

Current restrictions of such paging networks are not meant to limit the range or implementation of the  
10 present invention, but are described herein for illustrative purposes only. It is anticipated that such paging networks, including those based on the TME/X protocol, will be continually developed and that such new developments can be implemented in accordance with  
15 the present invention.

Wireless network 414 can also be configured as a TDMA network 412. TDMA (Time Division Multiple Access) is a telecommunications network utilized to separate  
20 multiple conversation transmissions over a finite frequency allocation of through-the-air bandwidth. TDMA can be utilized in accordance with the present invention to allocate a discrete amount of frequency bandwidth to each user in a TDMA network to permit many simultaneous  
25 conversations or transmission of data. Each user may be

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assigned a specific timeslot for transmission. A digital cellular communications system that utilizes TDMA typically assigns 10 timeslots for each frequency channel.

5

A hand held device operating in association with a TDMA network sends bursts or packets of information during each timeslot. Such packets of information are then reassembled by the receiving equipment into the original voice or data/information components. Current restrictions of such TDMA networks are not meant to limit the range or implementation of the present invention, but are described herein for illustrative purposes only. It is anticipated that TDMA networks will be continually developed and that such new developments can be implemented in accordance with the present invention.

Wireless network 414 can also be configured as a WIN (Wireless Intelligent Network) 415. WIN is generally known as the architecture of the wireless switched network that allows carriers to provide enhanced and customized services for mobile telephones. Intelligent wireless networks generally include the use of mobile switching centers (MSCs) having access to

network servers and databases such as Home Location  
Registers (HLRs) and Visiting Location Registers (VLRs),  
for providing applications and data to networks, service  
providers and service subscribers (wireless device  
5 users).

Local number portability allows wireless  
subscribers to make and receive calls anywhere -  
regardless of their local calling area. Roaming  
10 subscribers are also able to receive more services, such  
as call waiting, three-way calling and call forwarding.  
A HLR is generally a database that contains  
semipermanent mobile subscriber (wireless device user)  
information for wireless carriers' entire subscriber  
15 base.

HLR subscriber information includes identity,  
service subscription information, location information  
(the identity of the currently serving VLR to enable  
20 routing of communications), service restrictions and  
supplementary services/information. HLRs handle SS7  
transactions in cooperation with Mobile Switching  
Centers and VLR nodes, which request information from  
the HLR or update the information contained within the  
25 HLR. The HLR also initiates transactions with VLRs to

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complete incoming calls and update subscriber data.  
Traditional wireless network design is generally based  
on the utilization of a single HLR for each wireless  
network, but growth considerations are prompting  
5 carriers to consider multiple HLR topologies.

The VLR may be also configured as a database that  
contains temporary information concerning the mobile  
subscribers currently located in a given MSC serving  
10 area, but whose HLR may be elsewhere. When a mobile  
subscriber roams away from the HLR location into a  
remote location, SS7 messages are used to obtain  
information about the subscriber from the HLR, and to  
create a temporary record for the subscriber in the VLR.

15

Signaling System No. 7 (referred to as SS7 or C7)  
is a global standard for telecommunications. In the  
past the SS7 standard has defined the procedures and  
20 protocol by which network elements in the public  
switched telephone network (PSTN) exchange information  
over a digital signaling network to effect wireless and  
wireline call setup, routing, control, services,  
enhanced features and secure communications. Such  
25 systems and standards may utilized to implement wireless

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network 414, in accordance with the present invention.

Improved operating systems and protocols allow Graphical User Interfaces (GUIs) to provide an environment that displays user options (e.g., graphical symbols, icons or photographs) on a wireless device's screen. Extensible Markup Language ("XML") is generally a currently available standard that performs as a universal language for data, making documents more interchangeable. XML allows information to be used in a variety of formats for different devices, including PCs, PDAs and web-enabled mobile phones.

XML enables documents to be exchanged even where the documents were created and/or are generally used by different software applications. XML may effectively enable one system to translate what another systems sends. As a result of data transfer improvements, wireless device GUIs can be utilized in accordance with a hand held device and wireless network 414, whether configured as a paging network or another network type, to render images on the hand held device that closely represent the imaging capabilities available on desktop computing devices.

FIG. 29 depicts a block diagram 416 illustrating the interaction of wireless network 414, a hand held device 416, and cash management modules, in accordance with preferred embodiments of the present invention.

5 Cash management modules include a third-party provider 418, coupon manager 450, credit manager 422, product manager 424 and POS 426. Wireless network 414 of FIG. 29 may be analogous to wireless network 414 of FIG. 28.

In FIG. 28 and FIG. 29, like parts are indicated by  
10 identical reference numerals.

FIG. 30 illustrates a block diagram of a hand held device 416, in accordance with preferred embodiments of the present invention. Hand held device 416 includes a  
15 coupon management module 430, which can communicate with a hand held device coupon database 432. Hand held device 416 of FIG. 30 is generally analogous to hand held device 416 of FIG. 29 and the other hand held devices described and illustrated herein, such as hand  
20 held device 11 of FIG. 1. Thus, in FIG. 30 and 31, like parts are indicated by like reference numerals.

A user profile associated with coupon management module 430 may be stored within hand held device coupon  
25 database 432 or may be provided as a separate user

profile module 433. Again, the user profile may be used to filter out unwanted coupons during hand held device synchronization with network-based coupon providers (e.g., brokers, third party providers) or the POS. User  
5 profiling enables more personalized, targeted couponing exchanges with a use of hand held device 416. Use of a profile may allow a user to retrieve targeted (profile matching) coupons automatically from any coupon providing sources achieving communication with the hand  
10 held device 416.

FIG. 31 depicts a block diagram 439 of a hand held device 431 configured with an optical scanner module 435 and optical scanner 437, in accordance with preferred  
15 embodiments of the present invention. Hand held device 431 is generally analogous to hand held device 416 of FIG. 30. Hand held device 431 includes a CPU 10. CPU 10 of FIG. 31 is generally analogous to CPU 10 of FIG. 1. Those skilled in the art will appreciate that  
20 although CPU 10 is not depicted in FIG. 30, hand held device 416 of FIG. 30 operates in association with such a CPU.

Thus, FIG. 30 and FIG. 31 are merely high level  
25 representations of a hand held device. Optical scanner



module 435 functions as scanning software for optical scanner 437 and communicates with CPU 10 and coupon management module 430 to retrieve and store coupon data (i.e., electronic coupons) from static references, such as a bar code. Thus, those skilled in the art can appreciate that optical scanner 437 may be configured as a bar code reader.

Optical scanner 437 may also be configured as an optical scanner that retrieves images. For example, optical scanner 437 can scan an image such as a photograph or other graphical representation from a static reference source, such as a magazine or newspaper, and store such information within a database in hand held device 431.

If such graphical representations contain coupon data therein or graphical representations of coupons, such graphical representations can be stored within hand held device coupon database 432 as coupon data. Optical scanner 437 may also be implemented as a holographic scanner for scanning and retrieving holographic representations embedded as holograms or holographic representations on newspapers, magazines, cloth, etc.

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The networks described herein can be configured also as a client/server architecture, such as the Internet, to permit users to acquire coupons or communicate with third-party providers, transaction  
5 brokers, or the retail establishment and engage in coupon exchanges initiated from the hand held device. Thus, for example, network 143 of FIG. 19 and FIG. 20 can be configured as such a client/server architecture. FIGS. 31 to 33 describe a network based on a  
10 client/server architecture that can be utilized in association with the present invention.

In FIG. 32, FIG. 33, and FIG. 34, like parts are indicated by identical reference numerals. FIG. 31  
15 illustrates a block diagram illustrative of a client/server architecture in accordance with preferred embodiments of the present invention. In FIG. 31, user requests 591 for data are sent by a client application program 592 to a server 588. Server 588 can be a remote  
20 computer system accessible over the Internet or other communication networks. Client application program 592 may be utilized in association with a hand held device.

Server 588 performs scanning and searching of raw  
25 (e.g., unprocessed) information sources (e.g., newswire

feeds or news groups) and, based upon these user requests, presents the filtered electronic information as server responses 593 to the client process. The client process may be active in a first computer system, and the server process may be active in a second computer system, communicating with one another over a communications medium, thus providing distributed functionality and allowing multiple clients to take advantage of the information-gathering capabilities of the server.

FIG. 32 illustrates a detailed block diagram of a client/server architecture in accordance with preferred embodiments of the present invention. Although the client and server are processes that are operative within two computer systems, these processes being generated from a high-level programming language (e.g., PERL), which may be interpreted and executed in a computer system at runtime (e.g., a workstation), it can be appreciated by one skilled in the art that they may be implemented in a variety of hardware devices, either programmed or dedicated.

Client 592 and server 588 communicate utilizing the functionality provided by HTTP. Active within client

592 may be a first process, browser 572, which establishes connections with server 588, and presents information to the user. Any number of commercially or publicly available browsers can be utilized in various implementations in accordance with the preferred embodiment of the present invention. For example, the Mosaic-brand browser available from the National Center for Supercomputing Applications (NCSA) in Urbana-Champaign, Illinois, can be utilized in accordance with preferred embodiments of the present invention. Other browsers, such as Netscape™, also provide the functionality specified under HTTP. "Netscape" is a trademark of Netscape, Inc.

Server 588 executes the corresponding server software, which presents information to the client in the form of HTTP responses 590. The HTTP responses 590 correspond with the Web pages represented using HTML, or other data generated by server 588. Server 588 provides HTML 594. With certain browsers, a Common Gateway Interface (CGI) 596 may be also provided, which allows the client program to direct server 588 to commence execution of a specified program contained within server 588. This may include a search engine that scans received information in the server for presentation to

the user controlling the client.

By utilizing this interface, and HTTP responses 590, server 588 may notify the client of the results of that execution upon completion. Common Gateway Interface (CGI) 596 may be one form of a gateway, a device utilized to connect dissimilar networks (i.e., networks utilizing different communications protocols) so that electronic information can be passed from one network to the other. Gateways transfer electronic information, converting such information to a form compatible with the protocols used by the second network for transport and delivery.

In order to control the parameters of the execution of this server-resident process, the client may direct the filling out of certain "forms" from the browser. This may be provided by the "fill-in-forms" functionality (i.e., forms 598), that is generally provided by some browsers, such as the Netscape-brand browser described herein. This functionality allows the user via a client application program to specify terms in which the server causes an application program to function (e.g., terms or keywords contained in the types of stories/articles, which are of interest to the user).

This functionality is generally an integral part of the search engine.

FIG. 34 depicts a diagram illustrative of a  
5 computer network, which can be implemented in accordance  
with preferred embodiments of the present invention.  
Computer network may be representative of the Internet,  
which can be described as a known computer network based  
on the client-server model discussed herein.  
10 Conceptually, the Internet includes a large network of  
servers 588 that are accessible by clients 592,  
typically users of personal computers, through some  
private Internet access provider 584 (e.g., such as  
Internet America) or an on-line service provider 586  
15 (e.g., such as America On-Line, Prodigy, Juno, and the  
like).

Each of the clients 592 may run a browser to access  
servers 88 via the access providers. Each server 588  
20 operates a so-called "Web site" that supports files in  
the form of documents and web pages. A network path to  
servers 88 may be identified by a Universal Resource  
Locator (URL) having a known syntax for defining a  
network collection. Computer network 580 can thus be  
25 considered a Web-based computer network.

FIG. 35 depicts a flow chart of operations 600 outlining general method steps for processing electronic coupons through hand held devices, in accordance with preferred embodiments of the present invention. The method steps outlined in FIG. 35 represent operations that may be utilized to carry out the present invention. As illustrated at block 602, the process may be initiated. A POS may be synchronized with a hand held device having at least one electronic coupon therein, as indicated at block 604.

The electronic coupon can be stored as electronic data in a coupon database within the hand held device. As depicted at block 606, the electronic coupon can be transferred from the hand held device to the POS, in response to synchronization of the POS and the hand held device. As illustrated at block 608, the electronic coupon can be redeemed at the POS, in response to transferring the electronic coupon from the hand held device to the point of sale. The process can then terminate, as indicated at block 610.

Those skilled in the art can appreciate that the operations outlined above can be modified to include

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other operations. For example, a coupon exchange can be electronically negotiated between the POS and the hand held device, in response to transferring the electronic coupon from the hand held device to the POS.

5 Additionally, coupon data can be transmitted coupon data from a coupon source to the hand held device during a synchronization between the hand held device and the coupon source. Coupon data contained in the coupon database within the hand held device can be reconciled,

10 in response to redeeming the electronic coupon at the point of sale. Such a reconciling operation can include the step of automatically deleting coupons utilized in a current transaction from the coupon database configured in the hand held device, and the step of providing new

15 coupons to the hand held device for storage as new coupon data.

Additionally, a product database associated with the POS can be accessed, and product data contained

20 therein retrieved. Coupon data transmitted from the hand held device can then be compared to such product data, in response to scanning a product code associated with at least one item to be purchased at the point of sale. An example of such a product database is product

25 database 84 of FIGS. 5 to 12 herein



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A coupon database associated with the POS can also be accessed. An example of such a coupon database is coupon database 82 of FIGS. 5 to 12 herein. Coupon data  
5 can then be retrieved from the coupon database associated with the POS. Coupon data transmitted from the hand held device can be then compared to coupon data retrieved from the coupon database associated with the POS, in response to scanning a product code associated  
10 with at least one item to be purchased at POS.

Matching coupon data may be then identified to calculate price discounts, in response to comparing coupon data transmitted from the hand held device to  
15 product data retrieved from the product database and coupon data retrieved from the coupon database associated with the POS. A subtotal price additionally can be compiled for items scanned at the point of sale, in response to scanning product codes associated with  
20 items to be purchased at the POS. A new total for such scanned items can be calculated at the POS, wherein the new total includes price discounts, in response to identifying matching coupon data to calculate price discounts.

25

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The hand held device can also be configured, as explained previously, with a coupon management module for managing the transmission, receipt and storage of at electronic coupons as coupon data within the hand held  
5 device. In addition, the coupon management module can be associated with such a hand held device coupon database. Examples of such a coupon management module and hand held device coupon database are respectively coupon management module 430 and hand held device coupon  
10 database 432 of FIG. 30. The POS can be synchronized with the hand held device through a network that may be wireline-based, wireless-based or a combination thereof. Additionally, electronic coupons (i.e., coupon data) can be transferred to the hand held device through such a  
15 network.

FIG. 36 illustrates a block diagram 619 illustrative of a system 620 for processing electronic coupons through hand held devices, including modules  
20 thereof, in accordance with preferred embodiments of the present invention. Based on the description thus far, those skilled in the art can appreciate that a system for processing electronic coupons through hand held devices can be configured with modules thereof to  
25 implement the present invention.

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Such modules, including the other modules discussed herein, can be implemented in the form of software modules. In the computer programming arts, a module can be implemented as a collection of routines and data structures that performs particular tasks or implements a particular abstract data type. Modules generally are composed of two parts. First, a software modules may list the constants, data types, variable, routines, and so forth, that can be accessed by other modules or routines. Second, a software module may be configured as an implementation, which may be private (i.e., accessible only to the module), and which contains the source code that actually implements the routines or subroutines upon which the module is based. Thus, when referring to a "module" herein, the present inventors are referring so such software modules or implementations thereof. Such modules can be utilized separately or together to form a program product that can be implemented through signal-bearing media, including transmission media and recordable media.

Thus, system 20 of block diagram 619 can be implemented with a synchronization module 622 for synchronizing a POS with a hand held device having at

least one electronic coupon therein. Additionally,  
system 20 includes a transfer module 624 for  
transferring electronic coupon(s) from the hand held  
device to the POS, in response to synchronization of the  
5 POS and the hand held device. The electronic coupon can  
thereafter be automatically redeemed at the POS, in  
response to transferring the electronic coupon, in the  
form of coupon data, from the hand held device to the  
POS. Synchronization module 622 can be configured to  
10 permit communication between the hand held device and  
the POS through a wireless-based or wireline-based  
network or a network based on a combination thereof.  
Likewise, transfer module 624 can be configured to  
permit data transfers through a wireless or wireline  
15 network, such as the various networks described herein.

FIG. 37 depicts a block diagram 621 illustrative of  
an alternative system 623 for processing electronic  
coupons through hand held devices, including modules  
20 thereof, in accordance with preferred embodiments of the  
present invention. In FIG. 36 and 37, analogous parts  
are indicated by identical reference numerals. Thus,  
those skilled in the art can appreciate that system 620  
of FIG. 35 can be expanded to include a variety of other  
25 modules, as indicated in block diagram 621 of FIG. 37.

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System 623 thus includes synchronization module 622, transfer module 624, and a redeeming module 626 for  
5 redeeming coupons at the POS, in response to transferring the electronic coupons from the hand held device to said POS. System 623 can also be configured to include a data storage module (i.e. memory) for storing electronic coupons as coupon data in a coupon  
10 database within the hand held device. An example of such a coupon database is hand held device coupon database 432 of FIG. 30 and FIG. 31.

Additionally, system 623 can be configured with a  
15 negotiating module 630 for electronically negotiating a coupon exchange between the POS and the hand held device, in response to transferring the electronic coupon from the hand held device to the POS. System 623 can also be configured with a transmission module 632  
20 for transmitting coupon data from a coupon source to the hand held device during a synchronization between the hand held device and the coupon source. System 623 can further be configured with a reconciling module 634 for reconciling module the coupon data contained in the  
25 coupon database within the hand held device, in response

to redeeming the electronic coupon at the point of sale.

Modules can also be organized as groups of modules within system 623. For example, module group 636, 5 configured with system 623, includes an access module 638 for accessing a product database associated with the POS, and a retrieval module 640 for retrieving product data from the product database associated with the POS.

Module group 636 can also be configured with a 10 comparing module 642 for comparing coupon data transmitted from the hand held device to the product data, in response to scanning a product code associated with an item to be purchased at the POS.

15 System 623 can also be configured with a module group 644 that includes an access module 646 for accessing a coupon database associated with the POS, a retrieval module 648 for retrieving coupon data from the coupon database associated with the POS, and a 20 comparison module 650 for comparing coupon data transmitted from the hand held device to coupon data retrieved from the coupon database associated with the POS, in response to scanning a product code associated with an item to be purchased at the point of sale.

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System 623 can also be configured with an identification module 652 for identifying matching coupon data to calculate price discounts, in response to comparing coupon data transmitted from the hand held  
5 device to product data retrieved from the product database and coupon data retrieved from the coupon database associated with the POS.

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Additionally, system 623 can be configured to  
10 include a module group 658 that includes a compiling module 658 for compiling a subtotal price for the items to be purchased at the POS, in response to scanning product codes associated with the item to be purchased at the POS. Module group 658 can also be configured  
15 with a calculation module 660 for calculating a new total for the item(s) scanned at the POS, wherein the new total includes price discounts, in response to identifying matching coupon data to calculate price discounts.

20

Finally, system 623 can be configured to include a module group 662 that includes a coupon management module 664 for managing the transmission, receipt and storage of electronic coupon as coupon data within the  
25 hand held device. Coupon management module 664 may be

generally resident within the hand held device. Additionally, module group 664 can be configured with an association module 665 for associating the coupon management module with the coupon database within the  
5 hand held device.

Those skilled in the art can appreciate that the hand held devices discussed herein may be modified to incorporate other computer-based and processing  
10 features. For example, a hand held device utilized in accordance with the present invention, may be configured with so-called "smart card" technology. Smart cards are generally known in the art as credit-card sized plastic cards with an embedded computer chip. The chip can  
15 either be a microprocessor with internal memory or a memory chip with non-programmable logic. The chip connection can be configured via direct physical contact or remotely through a contactless electromagnetic interface.

20

Smart cards may be generally configured as either a contact or contactless smart card, or a combination thereof. A contact smart card requires insertion into a smart card reader with a direct connection to a  
25 conductive micromodule on the surface of the card. Such



a micromodule may be generally gold plated. Transmission of commands, data, and card status takes place through such physical contact points.

5 A contactless card requires only close proximity to a reader. Both the reader and the card may be implemented with antenna providing a contactless link that permits the devices to communicate with one another. Contactless cards can also maintain internal  
10 chip power or an electromagnetic signal (e.g., RF tagging technology). Two additional categories of smart codes, well known in the art, which are based on contact and contactless cards are the so-called *Combi* cards and *Hybrid* cards.

15

A *Hybrid* card generally may be equipped with two chips, each with a respective contact and contactless interface. The two chips are not connected, but for many applications, this *Hybrid* serves the needs of consumers  
20 and card issuers. The *Combi* card may be generally based on a single chip and can be generally configured with both a contact and contactless interface.

Chips utilized in such smart cards are generally  
25 based on microprocessor chips or memory chips. Smart

cards based on memory chips depend on the security of the card reader for their processing and can be utilized when low to medium security requirements. A microprocessor chip can add, delete and otherwise  
5 manipulate information in its memory. Microprocessor-based memory cards typically contain microprocessor chips with 8, 16, and 32 bit architectures.

Thus, a smart card in accordance with the method  
10 and system described herein would not serve to replace a hand held device, such as a PDA. The smart card would instead function as a supplementary feature of the PDA. The hand held device can be configured to operate in association with a smart card adapted for use with the  
15 hand held device. In the case of a PDA, for example, the smart card can retrieve coupon data form a contact or contactless interface. The data may be stored in a memory location with the smart card. The smart card may be then temporarily connected to the PDA through a  
20 cartridge or other hardware interface to allow coupon data to be transferred from the smart card to the PDA. The PDA can then transfer coupon data to a POS for processing and redemption, according to the method and system described herein.

FIG. 38 illustrates a top view of a hand held device 700 and a smart card 706 adapted for use with hand held device 700, in accordance with preferred embodiments of the present invention. Hand held device 5 700 may be configured as a PDA or other hand held device. For example, hand held device 700 is generally analogous to hand held device 11 of FIG. 1 and other hand held device embodiments described herein, such as hand held device 431 of FIG. 31. Hand held device 700 10 may be thus equipped with a display unit 702 interfaced with user controls, such as user control 704.

Smart card 706 may be inserted through a slot in hand held device 700. Smart card 706 may be integrated 15 with a recorder/writer for writing data to smart card 706 or reading data from smart card 706 or otherwise modifying a memory of smart card 706. Thus, smart card 706 can retrieve coupon data from hand held device 700 or transfer coupon data stored in a memory of smart card 20 706 to a memory location within hand held device 700, such as a hand held device coupon database.

FIG. 39 depicts a side view of hand held device 700 depicted in FIG. 38 and a slot 708 for inserting smart 25 card into hand held device 700, in accordance with

preferred embodiments of the present invention. Slot 708 may be sized to receive smart card 706 into hand held device 700. FIG. 40 illustrates a hand held device 710 configured with smart card 706 adapted for use with  
5 hand held device 710 and a scanner 720 integrated with hand held device 710, in accordance with preferred embodiments of the present invention.

Hand held device 710 of FIG. 40 is generally  
10 analogous to hand held device 700 of FIGS. 38 and 39, the difference being that hand held device 710 includes scanner 720 for scanning or capturing images from static references or representations. Scanner 720 can thus be utilized by a user to retrieve electronic coupons  
15 graphically displayed on a static reference, such as a newspaper, magazine, or so forth. Scanner 720 can be configured as a bar code scanner for retrieving coded information associated with electronic coupon data.

20 Scanner 720 can be additionally configured as an optical scanner that captures graphical images representative of electronic coupons or associated coupon data. The captured information may be then processed and stored with a hand held device coupon  
25 database with hand held device 710. Scanner 720 can be

also configured as a plug-in module, such as those  
utilized in the popular Handspring Visor PDA.  
Furthermore, a plug-in may be adapted to incorporate  
both a smart card read/write portal and scanning  
5 hardware and/or associated software. It should also be  
appreciated based on the teachings herein that a plug-in  
may be adapted to combine smart card reader/writer  
portal and RF communications capabilities in order to  
provide applications, such as remote wireless credit  
10 card verification.

The embodiments and examples set forth herein are  
presented in order to best explain the present invention  
and its practical application and to thereby enable those  
15 skilled in the art to make and utilize the invention.  
However, those skilled in the art will recognize that the  
foregoing description and examples have been presented  
for the purpose of illustration and example only. The  
description as set forth is not intended to be exhaustive  
20 or to limit the invention to the precise form disclosed.  
Many modifications and variations are possible in light  
of the above teaching without departing from the spirit  
and scope of the following claims.

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